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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/563,121	Applicant(s) HARROLD ET AL.
	Examiner Gary C. Vieux	Art Unit 2622

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If no period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED. (35 U.S.C. § 133).

Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 03 January 2006.
 2a) This action is FINAL. 2b) This action is non-final.
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1-35 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
 5) Claim(s) _____ is/are allowed.
 6) Claim(s) 1-35 is/are rejected.
 7) Claim(s) _____ is/are objected to.
 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.
 10) The drawing(s) filed on 06 January 2006 is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) Notice of References Cited (PTO-892)
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
 3) Information Disclosure Statement(s) (PTO/GS-68)
 Paper No(s)/Mail Date _____

4) Interview Summary (PTO-413)
 Paper No(s)/Mail Date _____
 5) Notice of Informal Patent Application
 6) Other: _____

DETAILED ACTION

This is a first office action in response to application 10/563,121, filed on January 3, 2006, in which claims 1-35 are presented for examination. A Preliminary Amendment was filed on January 3, 2006, in which claims 5, 8, 10, 14, 19, 22, 24, 28 and 30-35 5 were amended to remove multiple dependencies.

Drawings

Figures 1a-11b should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in 10 compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office 15 action. The objection to the drawings will not be held in abeyance.

Specification

The disclosure is objected to because of the following informalities:
Please correct the disclosure to properly reflect the referenced copending 20 application described on lines 27-28 of page 19.
Appropriate correction is required.

Claim Objections

Claim 35 is objected to because of the following informalities: please change "the pitch" in line 2 to "a pitch" to present the proper antecedent basis. Appropriate correction is required.

5

Claim Rejections - 35 USC § 112, First Paragraph

The following is a quotation of the first paragraph of 35 U.S.C. 112:

10 The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-24 and 28-35 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter 15 which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Specifically, the claims, either directly or via dependence, reference the intensity profile of an image of a nominal human pupil. This "profile" is not defined or described 20 in the original disclosure in such a way as to adequately inform one skilled in the art of the meets and bounds of the "profile" to any degree that they could make and use the same, or conversely, to avoid making or using the same based on what has been provided in the disclosure.

Claim Rejections - 35 USC § 112, Second Paragraph

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5

Claims 1-24, 26, 27 and 30-35 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 1, from which claims 2-15 and 30-35 depend, the claim, at lines 10 9-15, recites what appears to be an incomplete limitation, possibly missing a verb(s) or descriptive wording to clearly connect the wherein clause relating to the pixel apertures with sub-limitations (a) and (b). Currently, the claim reads:

"wherein the pixel apertures are arranged so that across two adjacent columns the convolution in a direction perpendicular to the columns of:

15 (a) *the intensity profile of an image of a nominal human pupil in the nominal window plane formed in the pixel plane by the spatially multiplexing parallax element, and*

(b) the total height of the pixel apertures parallel to the columns of pixels varies by at most 5% of the maximum of the convolution."

20 In light of the above claim presentation, it is unclear from the claim, as currently written, how arrangement of the pixel apertures clearly and distinctly relates to the convolution, an intensity profile and the height of the apertures.

Further regarding claims 1 and 16, from which claims 2-15, 17-24 and 30-35 depend, the claim also recites the limitation "the intensity profile" in lines 11 and 10,

respectively. There is insufficient antecedent basis for this limitation in the claim and the meets and bounds of this limitation cannot be discerned to a degree of certainty in which the subject matter of the claim is definite in view of the original disclosure.

5 Regarding claims 12 and 26, from which claims 13 and 27 depend, line 3 of each claim recites "the edges". Not only is there is insufficient antecedent basis for this limitation in the claim, but it is also unclear whether "the edges" refer to one edge of each pixel in a group of pixels or multiple edges of the same pixel.

10 Further regarding claim 35, the claim also recites the limitation "the nominal viewing plane" in line 2. There is insufficient antecedent basis for this limitation in the claim, and the meets and bounds of this limitation cannot be discerned to a degree of certainty in which the subject matter of the claim is definite in view of the original disclosure.

15 For purposes of evaluation of the claims on their merits, the claim will be interpreted by the Examiner as best understood in light of the foregoing 35 U.S.C. 112 rejections and/or will be examined to the extent possible in light of the foregoing 35 U.S.C. 112 rejections.

Claim Rejections - 35 USC § 102

20 The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5 **Claims 1-8, 11-13, 16-22, 25-27 and 30-34** are rejected under 35 U.S.C. 102(b) as being anticipated by EP 0 625 861 A2 to Woodgate et al (hereinafter "Woodgate").

Regarding claim 1, Woodgate teaches an auto-stereoscopic display apparatus comprising a spatial light modulator (figs. 3 and 12, spatial light modulator 1) comprising an array of pixels arranged in rows and columns in a pixel plane, the pixels comprising 10 pixel apertures having gaps there between with the gaps between the columns of pixels extending substantially parallel to the columns of pixels (figs. 3 and 12, columns of pixels 2, 3, 4), and a spatially multiplexing parallax element (figs. 3 and 12, lenticular screen 6) capable of directing light from successive columns of pixels towards successive ones of two or more viewing windows in a nominal window plane, wherein 15 the pixel apertures are arranged so that across two adjacent columns the convolution in a direction perpendicular to the columns of (a) the intensity profile of an image of a nominal human pupil in the nominal window plane formed in the pixel plane by the spatially multiplexing parallax element, and (b) the total height of the pixel apertures parallel to the columns of pixels varies by at most 5% of the maximum of the 20 convolution (col. 3, line 39 - col. 4, line 9, wherein the observer perceives substantially constant intensity). The Examiner notes the claim language of "substantially" is a broad modifier, and as such, all associated claim language is considered in light of this modifier.

25 Regarding claim 2, Woodgate teaches all of the limitations of claim 2 (see the 102(b) rejection to claim 1 supra) including wherein the pixel apertures repeat at a pitch

substantially equal to a representative width of said intensity profile (fig. 3; col. 3, line 39 - col. 4, line 9).

5 Regarding claim 3, Woodgate teaches all of the limitations of claim 3 (see the 102(b) rejection to claim 2 supra) including wherein the pixel apertures of pixels of each colour have substantially the same, constant total height parallel to the columns of pixels (fig. 3). The Examiner notes the claim language of "substantially" is a broad modifier, and as such, all associated claim language is considered in light of this modifier.

10 Regarding claim 4, Woodgate teaches all of the limitations of claim 4 (see the 102(b) rejection to claim 3 supra) including wherein the pixel apertures of pixels of different colours have substantially the same total height parallel to the columns of pixels (fig. 3). The Examiner notes the claim language of "substantially" is a broad modifier, and as such, all associated claim language is considered in light of this modifier.

15 Regarding claim 5, Woodgate teaches all of the limitations of claim 5 (see the 102(b) rejection to claim 2 supra) including wherein the pixel apertures of pixels of each colour have substantially the same width perpendicular to the columns (figs. 3 and 12). The Examiner notes the claim language of "substantially" is a broad modifier, and as such, all associated claim language is considered in light of this modifier.

20 Regarding claim 6, Woodgate teaches all of the limitations of claim 6 (see the 102(b) rejection to claim 5 supra) including wherein the pixel apertures of pixels of different colours have substantially the same width (fig. 3). The Examiner notes the

claim language of "substantially" is a broad modifier, and as such, all associated claim language is considered in light of this modifier.

Regarding claim 7, Woodgate teaches all of the limitations of claim 7 (see the 102(b) rejection to claim 5 supra) including wherein the pixel apertures of pixels of 5 different colours have different widths (employing the configuration of fig. 12, each has varying widths) to compensate for chromatic aberration.

As to the claim limitation in which different widths are *to compensate for chromatic aberration*, while features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in 10 terms of structure rather than function. *In re Schreiber*, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997.) The instant reference teaches the structural limitations of the apparatus as cited above, and therefore meets the claim limitations as recited.

Regarding claim 8, Woodgate teaches all of the limitations of claim 8 (see the 15 102(b) rejection to claim 2 supra) including wherein along the rows of pixels, the pixels are arranged in groups consisting of a plurality of adjacent pixels of the same colour (fig. 3; e.g., rows associated with pixel 2).

Regarding claim 11, Woodgate teaches all of the limitations of claim 11 (see the 20 102(b) rejection to claim 1 supra) including wherein the total height of the pixel apertures parallel to the columns of pixels varies (employing the configuration of fig. 12, wherein the total height varies laterally).

Regarding claim 12, Woodgate teaches all of the limitations of claim 12 (see the 102(b) rejection to claim 11 supra) including wherein the total height of the pixel apertures parallel to the columns of pixels has a profile which increases towards the edges of the pixel apertures relative to the centre of the pixel apertures (fig. 12, wherein 5 an edge of each aperture has a profile that increases relative to each pixel center).

Regarding claim 13, Woodgate teaches all of the limitations of claim 13 (see the 102(b) rejection to claim 12 supra) including wherein the total height of the pixel apertures parallel to the columns of pixels has a profile which has a flat central portion (fig. 12, wherein each aperture has a flat central portion).

10 Regarding claim 16, Woodgate teaches an auto-stereoscopic display apparatus comprising a spatial light modulator (figs. 3 and 12, spatial light modulator 1) comprising an array of pixels arranged in rows and columns in a pixel plane, the pixels comprising pixel apertures having gaps there between with the gaps between the columns of pixels extending substantially parallel to the columns of pixels pixels (figs. 3 and 12, columns 15 of pixels 2, 3, 4), and a spatially multiplexing parallax element (figs. 3 and 12, lenticular screen 6) capable of directing light from successive columns of pixels towards successive ones of two or more viewing windows in a nominal window plane, wherein the pixel apertures repeat at a pitch equal to a representative width of an intensity profile of an image of a nominal human pupil in the nominal window plane formed in the 20 pixel plane by the spatially multiplexing parallax element (col. 3, line 39 - col. 4, line 9, wherein the observer perceives substantially constant intensity).

Regarding claim 17, Woodgate teaches all of the limitations of claim 17 (see the 102(b) rejection to claim 16 *supra*) including wherein the pixel apertures of pixels of each colour have substantially the same, constant total height parallel to the columns of pixels (fig. 3). The Examiner notes the claim language of "substantially" is a broad 5 modifier, and as such, all associated claim language is considered in light of this modifier.

Regarding claim 18, Woodgate teaches all of the limitations of claim 18 (see the 102(b) rejection to claim 17 *supra*) including wherein the pixel apertures of pixels of different colours have substantially the same total height parallel to the columns of 10 pixels (fig. 3). The Examiner notes the claim language of "substantially" is a broad modifier, and as such, all associated claim language is considered in light of this modifier.

Regarding claim 19, Woodgate teaches all of the limitations of claim 19 (see the 102(b) rejection to claim 16 *supra*) including wherein the pixel apertures of pixels of 15 each colour have substantially the same width perpendicular to the columns (fig. 3). The Examiner notes the claim language of "substantially" is a broad modifier, and as such, all associated claim language is considered in light of this modifier.

Regarding claim 20, Woodgate teaches all of the limitations of claim 20 (see the 102(b) rejection to claim 19 *supra*) including wherein the pixel apertures of pixels of 20 different colours have substantially the same width (fig. 3). The Examiner notes the claim language of "substantially" is a broad modifier, and as such, all associated claim language is considered in light of this modifier.

Regarding claim 21, Woodgate teaches all of the limitations of claim 21 (see the 102(b) rejection to claim 19 *supra*) including wherein the pixel apertures of pixels of different colours have different widths (employing the configuration of fig. 12, each has varying widths) to compensate for chromatic aberration.

5 As to the claim limitation in which different widths are *to compensate for chromatic aberration*, while features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function. *In re Schreiber*, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997). The instant reference teaches the structural 10 limitations of the apparatus as cited above, and therefore meets the claim limitations as recited.

Regarding claim 22, Woodgate teaches all of the limitations of claim 22 (see the 102(b) rejection to claim 16 *supra*) including wherein along the rows of pixels, the pixels are arranged in groups consisting of a plurality of adjacent pixels of the same colour (fig. 15 3; e.g., rows associated with pixel 2).

Regarding claim 25, Woodgate teaches an auto-stereoscopic display apparatus comprising a spatial light modulator (fig. 12, spatial light modulator 1) comprising an array of pixels arranged in rows and columns in a pixel plane, the pixels comprising pixel apertures having gaps there between with the gaps between the columns of pixels 20 extending substantially parallel to the columns of pixels (fig. 12), and a spatially multiplexing parallax element capable of directing light from successive columns of pixels towards successive ones of two or more viewing windows in a nominal window

plane, wherein the total height of the pixel apertures parallel to the columns of pixels varies (fig. 12, wherein the total height varies when viewed laterally).

Regarding claim 26, Woodgate teaches all of the limitations of claim 26 (see the 102(b) rejection to claim 25 supra) including wherein the total height of the pixel 5 apertures parallel to the columns of pixels has a profile which increases towards the edges of the pixel apertures relative to the center of the pixel apertures (fig. 12, wherein an edge of each aperture has a profile that increases relative to each pixel center).

Regarding claim 27, Woodgate teaches all of the limitations of claim 27 (see the 102(b) rejection to claim 26 supra) including wherein the total height of the pixel 10 apertures parallel to the columns of pixels has a profile which has a flat central portion (fig. 12, wherein each aperture has a flat central portion).

Regarding claim 30, Woodgate teaches all of the limitations of claim 30 (see the 102(b) rejection to claim 1 supra) including wherein the rows and columns are 15 perpendicular to each other (fig. 3).

Regarding claim 31, Woodgate teaches all of the limitations of claim 31 (see the 102(b) rejection to claim 1 supra) including wherein the display apparatus is switchable 20 between a first mode in which the spatially multiplexing parallax element is effective to direct light from successive columns of pixels towards an alternate one of two viewing windows and a second mode in which the spatially multiplexing parallax element has no effect (in the instance where a user/observer closes one eye, the functionality of the display apparatus is effectively switched to a mode in which the spatially multiplexing parallax element has no effect).

Regarding claim 32, Woodgate teaches all of the limitations of claim 32 (see the 102(b) rejection to claim 1 supra) including wherein the spatially multiplexing parallax element has a structure which is uniform in a direction parallel to the columns of pixels and which repeats in a direction parallel to the rows of pixels (fig 3, lenticular screen 6).

5 Regarding claim 33, Woodgate teaches all of the limitations of claim 33 (see the 102(b) rejection to claim 1 supra) including wherein the spatially multiplexing parallax element is a lenticular array (col. 3, lines 8-16).

Regarding claim 34, Woodgate teaches all of the limitations of claim 34 (see the 102(b) rejection to claim 1 supra) including wherein the spatially multiplexing parallax element has a structure which repeats at a pitch which is substantially an integer multiple of the pitch of the columns of the array of pixels (fig. 3, 4 x columns). The Examiner notes the claim language of "substantially" is a broad modifier, and as such, all associated claim language is considered in light of this modifier.

15 *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 9 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Woodgate in view of Examiner's Official Notice.

Regarding claim 9, Woodgate teaches all of the limitations of claim 9 (see the 102(b) rejection to claim 2 supra) except for expressly teaching wherein the pixels of each group are commonly addressable.

Nevertheless, Official Notice is taken regarding randomly addressable pixel
5 displays; a concept that is well-known and accepted in the art. It would have been
obvious to one of ordinary skill in the art at the time of the invention to have employed
randomly addressable pixel functionality with the display as taught by Woodgate in
order to allow for the most exact representation of image data by addressing adjacent
pixels in a display. The Examiner notes that the claim, as currently written, only
10 requires that the pixels have the potential to be commonly addressable and does not
require that they actually are commonly addressed.

Regarding claim 23, Woodgate teaches all of the limitations of claim 23 (see the 102(b) rejection to claim 22 supra) except for expressly teaching wherein the pixels of each group are commonly addressable.

15 Nevertheless, Official Notice is taken regarding randomly addressable pixel
displays; a concept that is well-known and accepted in the art. It would have been
obvious to one of ordinary skill in the art at the time of the invention to have employed
randomly addressable pixel functionality with the display as taught by Woodgate in
order to allow for the most exact representation of image data by addressing adjacent
20 pixels in a display. The Examiner notes that the claim, as currently written, only
requires that the pixels have the potential to be commonly addressable and does not
require that they actually are commonly addressed.

Claim 31 is also rejected under 35 U.S.C. 103(a) as being unpatentable over Woodgate in view of WO patent publication No. WO 03/015424 to Woodgate et al (hereinafter Woodgate '424), published February 20, 2003.

Regarding claim 31, Woodgate teaches all of the limitations of claim 31 (see the

5 102(b) rejection to claim 1 supra) except for teaching wherein the display apparatus includes an apparatus-based element for switching between a first mode in which the spatially multiplexing parallax element is effective to direct light from successive columns of pixels towards an alternate one of two viewing windows and a second mode in which the spatially multiplexing parallax element has no effect.

10 Nevertheless, Woodgate '424 teaches a similar apparatus that includes a polarization modifying element for switching between a first mode in which the spatially multiplexing parallax element is effective to direct light from successive columns of pixels towards an alternate one of two viewing windows and a second mode in which the spatially multiplexing parallax element has no effect (at least at p. 46-47). It would 15 have been obvious to one of ordinary skill in the art at the time of the invention to have employed the element for switching between 2D and 3D modes so that a user could have the ability exert control how the image data is presented (2D or 3D) and to whom (depending on user position).

Claim 35 is rejected under 35 U.S.C. 103(a) as being unpatentable over Woodgate.

Regarding claim 35, Woodgate teaches all of the limitations of claim 35 (see the 102(b) rejection to claim 1 supra) except for expressly teaching wherein the pitch of the 5 windows in the nominal viewing plane is less than 55 mm (where, in light of the outstanding 35 U.S.C. 112 rejection, supra, pitch is read to be equal to window width).

However, claimed limitations regarding an apparatus wherein the pitch of the windows in the nominal viewing plane is less than 55 mm, are akin to optimizing the values of a result effective variable (defining the pitch to achieve desired results of the 10 selected/employed glass thickness and viewing distance as defined by the distance between lens and pixel). Therefore, determining the optimal value of a result effective variable would have been obvious and ordinary within the skill of the art. *In re Boesch, 617 F.2d 272,276,205 USPQ 215, 219 (CCPA 1990)*.

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Examiner's Note

The Examiner cites particular figures, paragraphs, columns and line numbers in the reference(s), as applied to the claims above. Although the particular citations are representative teachings and are applied to specific limitations within the claims, other 20 passages, internally cited references, and figures may also apply. In preparing a response, it is respectfully requested that the Applicant fully consider the references, in their entirety, as potentially disclosing or teaching all or part of the claimed invention, as

well as fully consider the context of the passage as taught by the reference(s) or as disclosed by the Examiner.

Contact

5 Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gary C. Vieux whose telephone number is (571)272-7318. The examiner can normally be reached on IFW.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on 571-272-3022. The fax phone number for 10 the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.

15 For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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Gcv2
/Jason Chan/
Supervisory Patent Examiner, Art Unit 2622